

## Claims

What is claimed is:

1. A gateway for controlling call routing via a selected network, the gateway comprising:
  - a controller configured to support and control the functionality of the gateway;
  - a wireless local area network (LAN) transceiver, coupled to and cooperatively operable with the controller to form an association with a wireless communications unit;
  - a local loop interface coupled to and cooperatively operable with the controller to support a connection with a local loop; and
  - a wide area network (WAN) transceiver, coupled to and cooperatively operable with the controller to support a wireless connection with a WAN and forward a message via the WAN corresponding to call routing when the association with the wireless communications unit changes.
2. The gateway of claim 1, wherein the WAN transceiver and the controller operate:
  - to send a registration message via a WAN session to the WAN, the registration message effecting a call routing update so that calls to the wireless communications unit are routed to the local loop when the association is formed; and
  - to receive an acknowledgement of the registration message via the WAN session.

3. The gateway of claim 2, wherein the controller operates to assign a LAN address to the wireless communications unit, responsive to the acknowledgment.

4. The gateway of claim 1, wherein the WAN transceiver and the controller operate:

to send a deregistration message via a WAN session to the WAN, the deregistration message effecting a call routing update so that calls to the wireless communications unit are not routed to the local loop when the association is no longer available; and

to receive an acknowledgement of the deregistration message via the WAN session.

5. The gateway of claim 1, wherein the controller:

cooperatively with the local loop interface operates to receive an incoming call indication via the local loop;

cooperatively with the wireless LAN transceiver operates to forward the incoming call indication via a wireless LAN session with the wireless communications unit and receive a response from the wireless communications unit; and

cooperatively with the local loop interface and the wireless LAN transceiver answers an incoming call corresponding to the incoming call indication on the local loop and couples the incoming call to the wireless communications unit via the wireless LAN session when the response is received.

6. The gateway of claim 1, wherein:

the wireless LAN transceiver cooperatively with the controller receives a call request from the wireless communications unit via a wireless LAN session; and

when the local loop is available, the controller cooperatively with the local loop interface initiates a local loop call request to a public switched telephone network and receives one of a call ringing, a call answer, and a busy signal.

7. The gateway of claim 6, wherein:

the controller together with the local loop interface monitors the local loop for a busy condition prior to initiating the local loop call request; and

the controller cooperatively with the WAN transceiver sends a message via a WAN session indicating the local loop is busy upon initiating the local loop call request and a message indicating the local loop is idle when a call corresponding to the local loop call request has been completed.

8. The gateway of claim 6, wherein

the controller together with the local loop interface monitors the local loop for a busy condition;

when the busy condition is detected, the controller cooperatively with the WAN transceiver initiates a WAN call request corresponding to the call request via the WAN and responsive thereto receives, from the WAN, a status message corresponding to one of call ringing, a busy signal, and a call answer; and

the controller together with the wireless LAN transceiver forwards to the wireless communications unit a message corresponding to the status message.

9. The gateway of claim 8, wherein when the status message is a call answer, the controller and the WAN transceiver operate to set up a WAN call and the controller and the wireless LAN transceiver operate to couple the WAN call to the wireless communications unit via the wireless LAN session.

10. The gateway of claim 6, wherein:  
the controller together with the local loop interface monitors the local loop for a busy condition and when the busy condition is detected further determines whether the busy condition results from another wireless LAN session with the wireless communications unit; and  
when the busy condition results from the other wireless LAN session, the controller together with the local loop interface operates to initiate a conference call via the local loop.

11. The gateway of claim 1, wherein:  
the LAN transceiver is operable on one of an IEEE 802.11 network and a HiperLan network; and  
the WAN transceiver is operable on one of packet data WAN, a 3G WAN, a UMTS WAN, and a broadband WAN.

12. A method of controlling call routing via a selected network, the method comprising:

detecting at a gateway a wireless communications unit operable on a wireless local area network (LAN);

establishing a connection between the gateway and a wireless wide area network (WAN) via the wireless WAN; and

forwarding a message via the wireless WAN, the message including call routing information for the communication unit.

13. The method of claim 12, wherein the forwarding the message further comprises forwarding a registration message via a WAN session to the WAN, the registration message effecting a call routing update so that calls to the wireless communications unit are routed to a local loop that is coupled to the gateway when the wireless communications unit is detected; and

the method further comprises receiving an acknowledgement of the registration message via the WAN session.

14. The method of claim 13, further comprising, assigning a LAN address to the wireless communications unit, responsive to the acknowledgment.

15. The method of claim 12, wherein the forwarding the message further comprises forwarding a deregistration message via a WAN session to the WAN, the deregistration message effecting a call routing update so that calls to the wireless communications unit are not routed to a local loop that is coupled to the gateway when the wireless communications unit is no longer detected; and

the method further comprises receiving an acknowledgement of the deregistration message via the WAN session.

16. The method of claim 12, further comprising:  
receiving an incoming call indication via a local loop;  
establishing a wireless LAN session with the wireless communications unit;  
forwarding the incoming call indication to and receiving a response from the wireless communications unit via the wireless LAN session; and

when the response is received, answering an incoming call corresponding to the incoming call indication on the local loop and coupling the incoming call to the wireless communications unit via the wireless LAN session.

17. The method of claim 12, further comprising:

- receiving a call request from the wireless communications unit via a wireless LAN session;
- monitoring a local loop for a busy condition;
- when the local loop is not busy, initiating a local loop call request corresponding to the call request to a public switched telephone network and receiving one of a call ringing, a call answer and a busy signal; and
- sending a message via a WAN session indicating the local loop is busy upon initiating the local loop call request and a message indicating the local loop is idle when a call corresponding to the local loop call request has been completed.

18. The method of claim 17, further comprising:

- when the busy condition is detected, initiating a WAN call request corresponding to the call request via the WAN and responsive thereto receiving, from the WAN, a status message corresponding to one of call ringing, a busy signal, and a call answer; and
- forwarding to the wireless communications unit a message corresponding to the status message.

19. The method of claim 18, further comprising:

- when the status message is a call answer, setting up a WAN call; and
- coupling the WAN call to the wireless communications unit via the wireless LAN session.

20 The method of claim 17, further comprising:

when the busy condition is detected, determining whether the busy condition results from another wireless LAN session with the wireless communications unit;  
and

when the busy condition results from the other wireless LAN session,  
initiating a conference call via the local loop.

21. The method of claim 12, practiced by a residential gateway wherein:

the LAN is one of an IEEE 802.11 network and a HiperLan network; and

the WAN is one of a packet data WAN, a 3G WAN, a UMTS WAN, and a  
broadband WAN.



22. A method of selecting a network for initiating a call, the method comprising:

- receiving a call request from a wireless communications unit via a WLAN session;
- checking the status of a first network and;
  - when the first network is available initiating, via the first network, a first network call request corresponding to the call request and sending a message via a second network indicating that the first network is no longer available; and
  - when the first network is not available, initiating, via the second network, a second network call request corresponding to the call request.

23. The method of claim 22, wherein initiating a first network call request further comprises:

- receiving one of a call ringing, a call answer and a busy signal; and
- sending a message indicating that the first network is idle when a call corresponding to the first network call request has been completed.

24. The method of claim 22, wherein initiating a second network call request further comprises:

- receiving, from the second network, a status message corresponding to one of call ringing, a busy signal, and a call answer; and
- forwarding to the wireless communications unit a message corresponding to the status message.

25. The method of claim 22, further comprising:

determining whether the first network is not available as a result of another WLAN session with the wireless communications unit; and

when the first network is not available as a result of the another WLAN session, initiating a conference call via one of the first network and the second network.

26. The method of claim 22, further comprising:

receiving an indication of an incoming call; and

selecting one of providing a ringing message to the wireless communication unit, not providing the ringing message to the wireless communication unit, and providing the ringing message to the wireless communications unit depending on a caller identification (ID) of a calling party.